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Paper Abstract

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Technology Developed By: JPL's Robotics and Advanced Computing Section 347

Technology Developed For: JPL's Space Simulator Test Facilities, Section 357

Paper Title: Operation of the JPL Satellite Test Assistant Robot (STAR) and Its Integral Infrared Imaging Camera in a Thermal/Vacuum test Environment

Category: Test & Measurement, Robotics, Video/Imaging

Description: A new multi-axis, multi-camera, robotic inspection system (STAR) has been developed for use inside JPL's thermal/vacuum test chambers wherein satellites and other flight hardware are tested in a simulated space environment. STAR provides the unique ability to view and record stereoscopically, and from different perspectives, images of test article hardware in a thermal/vacuum environment. An advanced commercial infrared imaging camera was integrated as part of STAR's instrumentation system. This paper describes the STAR system, including the infrared imaging camera and presents STAR's performance results from a series of thermal/vacuum test runs in a 6×10^{-7} torr, -190°C test environment.

Two JPL Sections collaborated in the design and development phases of the project. Section 357 personnel provided functionality, material and cleanliness specifications and Section 347 personnel designed and developed the electrical, optical and mechanical systems to meet these specifications.

The STAR system can be replicated for use in other thermal/vacuum test chambers for NASA or commercial applications.